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SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
FOR
Kinder Morgan Liquid Terminals, LLC

Linnton Terminal
11400 NW St. Helens Road
Portland, Oregon 97231-1036

Original Date of Plan:
Date of Last Plan Amendment/ P.E. Certification: 9/1999
Date of Last Plan Review: 9/1999
Designated Person Responsible for Spill Prevention:
P. Murphy

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices and applicable industry standards.

Engineer: Frances L. Ryan-Torres

Signature:

Registration Number: CS7062

State: California

Date 10/14/2003

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
KINDER MORGAN LIQUID TERMINALS, LLC– Linnton Terminal

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FIGURES

ATTACHMENTS

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

1 FACILITY OWNER AND OPERATOR

1.1 Facility Owner

Kinder Morgan Liquid Terminals, LLC
1100 Town & Country Road.
Orange, California 92868
(714) 560-4873

1.2 Facility Operator

Name:	Linnton Terminal – Kinder Morgan Liquid Terminals, LLC
Site Address:	11400 NW St. Helens Road, Portland, OR 97231-1036 (see **Figure 1**)
Phone Number:	(503) 209-4390
Nature of Business:	Marine Terminal Facility in conjunction with common carrier petroleum pipeline (see **Figure 2**)
SIC Code:	4226
Commenced Operations:	Prior to 1941
Maximum Storage Capacity	280,589 bbls (11,784,738 gal)
Safe Fill	249,522 bbls (10,479,924 gal)
Normal Daily Throughput	2632 bbls (110,544 gal)
Person in Charge:	~~P. Murphy~~ WH Stevenson
Title:	Area Manager
Telephone Number:	~~(503) 775-7383 (home)~~ 360 514 0519 ~~(503) 220-1254 (~~business) 503 220-1263
Designated Person Accountable for Spill Prevention:	~~P. Murphy~~ WH Stevenson

2 SPILL HISTORY §112.4(a)

Date	Product	Quantity released	Comment
2/12/91	Diesel	Unknown/small	Barge tank overflow
2/18/93	Fuel oil	1 gallon	Sampling valve bumped open
4/5/93	Marine diesel	< 1 gallon	Vessel fuel transfer overfill
5/28/93	Diesel	2 gallons	Vessel tank overfill
8/10/94	Diesel	5 gallons	Dock line over-pressured
12/29/94	Diesel	2 gallons	Pipeline leak
10/16/97	gasoline	< 1 gallon	Thermal over-pressure of dock line/ valve

No spill greater than (1) one discharge of 1,000 gallons or (2) 2 discharges greater than 42 U.S. gallons has occurred within the last 12 months.

3 INTRODUCTION

This Spill Prevention Control and Countermeasure Plan (SPCC Plan) was prepared to comply with the requirements of Part 112, Oil Pollution Prevention of the Code of Federal Regulations Title 40 (40 CFR). Part 112 establishes the requirements for procedures, methods, and equipment to assist in preventing an accidental discharge of oil or any material containing oil from entering into or upon the navigable waters of the United States or adjoining shorelines. These procedures, methods, and equipment are referred to as the SPCC Plan. Part 112 applies to those owners or operators of non-transportation-related onshore and offshore facilities engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, or consuming oil or oil products. The applicable facility must also be in a location such that if an oil spill event occurred, the oil spill would be expected to reach navigable waters and the amount of oil discharged would be in harmful quantities as defined in 40 CFR, Part 110[1]. This SPCC Plan has been developed in accordance with the guidelines set forth in 40 CFR, §112.7 and §112.8, and is based upon site visits and interviews conducted with facility personnel during July 2002.

4 EMERGENCY RESPONSE PROCEDURES

4.1 Control of Potential Spills

In the event of an oil spill, facility personnel are trained to immediately shut down the source of the spill (stop flow) then inform the Area Manager or designee of the spill. Employees will attempt to control the spill with the emergency equipment available at the facility and any other necessary means of control. The Area Manager or designee will assess the situation and follow normal reporting procedures, including calling emergency response agencies by dialing 9-1-1 if the spill cannot be immediately controlled by facility personnel.

Linnton KMLT is operated 24-hours a day. The tanks are equipped with high and high-high level alarm systems. If the product level in any tank triggers the high level alarm, an alarm will sound throughout the terminal alerting the operator to the situation. The high-high alarm also sounds at the Olympic Pipeline Station and they will also notify the terminal. Once the alarm is received, the terminal personnel will respond and inspect the area and equipment for a potential spill event. If necessary, the personnel at the site will implement the emergency procedures in accordance with this SPCC Plan and company guidelines.

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1 A harmful quantity is defined as a quantity that has been determined to be potentially harmful to the public health or welfare of the United States, except as provided in §110.7. The discharges include those that: (a) violate applicable water quality standards, or (b) cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines (40 CFR, §110.3).

The responsible party designated in the following **Agency Phone Numbers** table will notify the necessary agencies when a spill reaches navigable water, or adjoining shorelines, or natural resources under management authority of the U.S., or a spill results in a release exceeding the limits allowed by law. The agencies will be contacted when the conditions of the event allows and within 72-hours of the first report of the emergency event.

4.2 Agency Phone Numbers (§112.7(a)(3)(vi))

Agency	Phone Number	Responsible Party
Fire Dept	911	Area Manager
National Response Center	(800) 424-8802	Orange Control Center
Oregon Emer Resp System (OERS)	503-452-0311	Orange Control Center
Oregon Dept of Env. Quality Spill Response Duty	503-229-5263	Orange Control Center
U.S. Coast Guard (Portland MSO)	503-240-9379	Area Manager
City of Portland Em Resp Sys	911	Area Manager

4.3 Nearest Navigable Water (§112.1(a)(1))

The nearest navigable water to the site is the Willamette River, located approximately 10 yards east of the facility. The direction of flow from any equipment that could produce a release of oil is diverted to a containment area (see **Figure 2**). If an oil spill event occurs, the containment area is drained of the oil in accordance with company procedures outlined in this SPCC Plan and all federal, state, and local requirements.

4.4 Available Emergency Equipment

Emergency equipment should be available at the facility to assist in controlling a spill event or cleaning up a spill. The following emergency equipment is available at the facility:

- Boom/ dock; loading rack; pump house (railcar)
- Wheeled Ansul
- Rack Mounted Water Deluge System
- Absorbent material
- Fire extinguishers
- Foam extinguishing systems (AFFF)

A vacuum truck contractor will be contacted to recover spilled oil material. The recovered materials will be disposed of in accordance to applicable federal, state, and local regulations.

4.5 Prevention and Mitigation of an Oil Spill Event

In order to prevent a spill event or mitigate the clean-up of an oil spill, a brief discussion of operational practices on prevention for each oil storage area or pumping area is outlined in **Tables 1 through 5**.

TABLE 1

Area of Exposure	Lower Tanks (17020, 17018, 17027, 45028, 11019, 11017, 30016, 59029, 55008 & 20011)
Potential Type or Cause of Spill	Rupture, leakage or overflow
Direction of Flow (§112.7(b))	None
Rate of Flow (§112.7(b))	7,500 bbls/hr
Maximum Spill (§112.7(b))	Volume of largest tank (Tank 59029: 50,257 bbls; 2,110,794 gals)
Containment (§112.7(c)): Type	Concrete wall sufficiently impervious to hold spill.
Capacity	Volume of largest tank plus 7.34 ft. of freeboard (Total = 219,689.4 bbls/ 9,226,955 gals)
Containment Drainage (§112.7(c)): Equipment	Sump, oil water separator, Vacuum truck
Procedure	Sump water is transferred to Tank 3034 for discharge under NPDES permit; product recovery evacuated to available transmix tank
Control Equipment (§112.8(c)(8)): Type	Flow deviation alarm for pipelines; high-high and high/low level audible/visual alarms, side gauging for tanks
Testing	Alarms and gauges are tested periodically
Methods of Recovery	Sorbent booms, contract and company maintenance crews and equipment, outside spill containment companies, soil remediation and treatment, vacuum trucks for water, or appropriate groundwater investigation and remediation

TABLE 2

Area of Exposure	Upper Tanks (10007, 55021- 55023, 2501-2503, 2024, 305, 306, 309-315, 326, 330, 331, & 532)
Potential Type or Cause of Spill	Rupture, leakage or overflow
Direction of Flow (§112.7(b))	none
Rate of Flow (§112.7(b))	7,500 bbls/hr
Maximum Spill (§112.7(b))	Volume of largest tank (Tank 55021: 55,345 bbls; 2,324,490 gals)
Containment (§112.7(c)): Type	Concrete walls sufficiently impervious to hold spill
Capacity	Volume of largest tank plus 10.81 ft freeboard (Total: 100,608.38 bbls/ 4,225,552.1 gals)
Containment Drainage (§112.7(c)): Equipment	Sump, oil water separator, Vacuum truck
Procedure	Sump water is transferred to Tank 3034 for discharge under NPDES permit; product recovery evacuated to available transmix tank
Control Equipment (§112.8(c)(8)): Type	Flow deviation alarm for pipelines; high-high and high/low level audible/visual alarms, side gauging for tanks
Testing	Alarms and gauges are tested periodically
Methods of Recovery	Sorbent booms, contract and company maintenance crews and equipment, outside spill containment companies, soil remediation and treatment, vacuum trucks for water, or appropriate groundwater investigation and remediation

TABLE 3

Area of Exposure	Terminal Manifold
Potential Type or Cause of Spill	Rupture, leakage or overflow
Direction of Flow (§112.7(b))	North to drain valves
Rate of Flow (§112.7(b))	7,500 bbls/hr
Maximum Spill (§112.7(b))	1,875 bbls / 78,750 gals (15 minutes at maximum flow rate)
Containment (§112.8(b)): Type	Asphalt berms sufficiently impervious to hold spill
Capacity	9.8 minutes at maximum flow rate (Total: 1,235.09 bbls/ 51,873.8 gals)
Containment Drainage (§112.8(b)): Equipment	Vacuum truck
Procedure	Evacuate product to available transmix tank
Control Equipment (§112.8(c)(8)): Type	Flow deviation alarm for pipelines
Testing	Alarms and relief valves are tested and calibrated periodically
Methods of Recovery	Sorbent booms, contract and company maintenance crews and equipment, outside spill containment companies, soil remediation and treatment, vacuum trucks for water, or appropriate groundwater investigation and remediation

TABLE 4

Area of Exposure	Loading Rack 1 (out-of-service)
Potential Type or Cause of Spill	Rupture, leakage or overflow
Direction of Flow (§112.7(b))	Center of loading rack to drain
Rate of Flow (§112.7(b))	95 bbls / 3,990 gals (maximum)
Maximum Spill (§112.7(h)(1))	Volume of single compartment truck (95 bbls/ 3,990 gals)
Containment (§112.7(c)): Type	Concrete curbs, loading rack drain, sump, OWS tank sufficiently impervious to hold spill
Capacity	520.93 bbls (21,879 gal) +10,000 gal. holding sump+ 3,979 gal. Sump #1 + 3,000 gal. OWS + Tk 3034
Containment Drainage (§112.7(h)(1-3)): Equipment	Trench drain, holding sump, sump #1, oily water separator (@ 3,000 gal)
Procedure	Gravity drains to sump; pumped through holding sump to oily water separator; water pumps automatically to Tk 3034
Control Equipment (§112.7(h)(2)): Type	Scully light system indicates when a truck is attached to the rack equipment. Signs are provided at each rack to ensure removal of rack equipment prior to departure.
Testing	N/A
Methods of Recovery	Sorbent booms, contract and company maintenance crews and equipment, outside spill containment companies, soil remediation and treatment, vacuum trucks, or appropriate groundwater investigation and remediation.

TABLE 5

Area of Exposure	Ethanol Railcar (out-of-service)
Potential Type or Cause of Spill	Leakage or overflow (evaporates quickly)
Direction of Flow (§112.7(b))	none
Rate of Flow (§112.7(b))	500 bbls/ 21,000 gals (maximum)
Maximum Spill (§112.7(h)(1))	Volume of single compartment railcar (500 bbls/ 21,000 gal)
Containment (§112.7(c)): Type	Gravel surface sufficiently impervious to hold spill
Capacity	100 gals
Containment Drainage (§112.7(h)(1-3)): Equipment	Spill response kits located at the lube house
Procedure	Use spill kits as necessary and store in drums
Control Equipment (§112.7(h)(2)): Type	Sorbent booms, contract and company maintenance crews /equipment.
Testing	N/A
Methods of Recovery	Sorbent booms, contract and company maintenance crews and equipment, outside spill containment companies, soil remediation and treatment, vacuum trucks, or appropriate groundwater investigation and remediation.

5 DRAINAGE

5.1 Containment Areas (§112.7(a)(3)(iii))

Containment areas located at the facility possess valves or other means of restraint to prevent the spill or excessive leakage of oil into a drainage system not designed to handle spills. Valves used to drain the containment area are locked closed and manually operated. Flapper-type drain valves are not employed for the drainage of the containment area. If a spill event is suspected storm water that may be present in the containment area is inspected before being drained from the containment area into an oil water separator and pumped to a fixed storage tank (No. 3034).

5.2 Facility (§112.8(b))

The facility drainage system is constructed to aid in preventing oil from reaching navigable waters. Facility drainage is diverted to a sump/oily water separator/ tank. The treated water is discharged under an NPDES permit (No. 1300-J) to the Willamette River, which is adjacent to the dock facility. Prior to being drained, the contents of Tank-3034 is inspected and tested for compliance with NPDES permit./ local water quality standards.

6 BULK STORAGE TANKS

6.1 Tank Construction (§112.8(c)(1))

All tanks are constructed in conformance with the requirements as stipulated in the most recent edition of API Standard 650, and GATX's storage tank specifications, whichever was more stringent at the time of installation. The construction and materials of storage tanks or containers are compatible with the oil products stored. All aboveground storage tanks (ASTs) are placed on 3 inches of oil sands to prevent external corrosion, reduce settling and serve as a method of leak detection.

6.2 Secondary Containment (§112.8(c)(2))

Secondary containment for ASTs is provided to contain the entire contents of the largest single tank plus sufficient freeboard to offset the accumulation of any potential precipitation into the containment area (see **Prevention and Mitigation of an Oil Spill Event, Tables 1 and 2**). The containment area is constructed to be sufficiently impervious to contain spilled oil.

6.3 Drainage from Secondary Containment Area (§112.8(c)(3))

Oil is removed from the containment area by pumping the contents to a proper holding vessel to be recovered or properly disposed. The containment area continuously accumulates storm water in a sump/ separator/ Tank-3034 system to ensure any discharge from the facility will be in compliance with applicable water quality standards and will not cause a harmful discharge as defined in 40 CFR, Part 110. Tank 3034 suction is closed prior to testing. Tank-3034 discharge is closed and locked prior to testing. Drainage is completed by manually opening the drain valves, if available, or pumped from the containment area. Forms for recording the drainage of the secondary containment area are included as the **Rainwater Inspection and Drainage Report (Attachment 2)**. Adequate records of such events must be maintained whenever the secondary containment area is drained.

6.4 Maintenance and Inspection of Tanks (§112.8(c)(6))

Inspections of ASTs and other equipment (e.g., foundations and supports) are visually inspected and documented on the **Tank Integrity Report** on a regular basis for indications of deterioration, leaking equipment, or accumulation of oil inside the containment area (see **Attachment 3**). High liquid level audible and visible alarms and direct vision gauges are used to determine the liquid level for each storage tank and ensure there is no leakage from the tank.

If an inspection reveals a visible oil leak from a tank seam, gasket or bolt sufficiently large enough to cause accumulation of oil in the containment area, the problem will be promptly corrected. A record of the correction actions are maintained for a minimum of three years as discussed in **Inspections and Records** of this SPCC Plan.

6.5 Buried Metallic Storage Tanks (40 CFR 112.8(c)(5))

There are no buried or partially buried metallic storage tanks at this facility (see 40 CFR 280).

6.6 Internal Heating Coils (40 CFR 112.8 (c)(7))

Internal heating coils are not used in storage tanks at this facility.

6.7 Portable or Mobile Storage Tanks (40 CFR 112.8(c)(11))

There is one mobile/portable storage tank located within the Tank Farm.

7 Facility Transfer Operations, Pumping, and In-Plant Process (40 CFR 112.8(d)(1-4))

7.1 Pipes, Valves, and Joints (§112.8(d)(1))

Aboveground piping is visually inspected on a regular basis for indications of deterioration. Aboveground piping and valves are regularly examined by operating personnel in accordance with 40 CFR 112.8(d)(1). In the case of buried piping, protective wrapping, coating and cathodic

protection is provided. Whenever a buried pipe is exposed, the pipe is inspected for deterioration. If indications of severe pipe deterioration is found, additional examination and corrective action will be conducted to mitigate the potential for an oil spill event.

7.2 Pipe Maintenance and Protection (§112.8(d)(2-3))

Piping at the facility is located in areas with respect to the facility drainage such that if a failure were to occur, a spill reaching navigable waters is minimized. All pipe supports are made of reinforced concrete or structural steel, and designed to minimize abrasion and corrosion and allow for expansion and contraction. Valves are blinded off if out of service for extended periods. The location of the piping with respect to roadways is not endangered by normal vehicular traffic and does not warrant warning signs.

7.3 Loading and Unloading of Tanker Trucks and Tanks (§112.7(h)(1-3))

Oil unloading operations performed at the facility are provided within secondary containment. Truck loading procedures, provided in **Attachment 7- Safety and Operating Procedures for Driver Loading of Tank Trucks at Pipeline Terminal Loading Racks**, meet the minimum requirements and regulations established by the Department of Transportation.

Loading racks have visible signs describing loading instructions to aid in preventing vehicular departure before the complete disconnection of the transfer lines. The drainage system of the loading rack is connected to the oily water separator. Before the truck leaves the area, an inspection is completed to ensure that hoses are disconnected and valves, drains, or other opening s are secured to prevent oil spillage.

8 INSPECTIONS AND RECORDS (§112.7(e))

Equipment is visually monitored routinely. Inspections that indicate a leak, potential oil spill event, or equipment failure require an inspection form identifying the location of the inspected area, inspectors name, date, procedures to mitigate or abate the problem, and any comments. Records and inspection forms are filed and maintained onsite for a minimum of three years.

9 SECURITY (§112.7(g)(1-5))

9.1 Facility (§112.7(g)(1, 5))

The facility is fully fenced and properly secured to restrict unauthorized access to the facility. Only authorized vehicles are permitted in areas away from established roadways. Lighting is also available to assist facility personnel identifying a spill during hours of darkness. The lighting also assists in deterring vandalism of the facility during hours of darkness.

9.2 Equipment (§112.8(d)(2))

Valves or drains that permit the direct outward flow of the tank's contents (e.g., water draw valves) to the surface are secured and locked in a closed position when not in use. Dike valves which allow for the draining from the secondary containment area are locked closed and can only be opened with consent of the Area Manager or his designee requiring his inspectionand are opened as weather dictates. A log is maintained of each draining. All pump controls are located at a point only accessible to authorized personnel. The loading or unloading connections of any pipeline is capped or blank-flanged when out of service for an extended time. In addition, when a pipeline is out of service for an extended time, the pipeline is injected with an inert gas.

10 PERSONNEL: TRAINING AND SPILL PREVENTION PROCEDURES (§112.7(f)1-3)

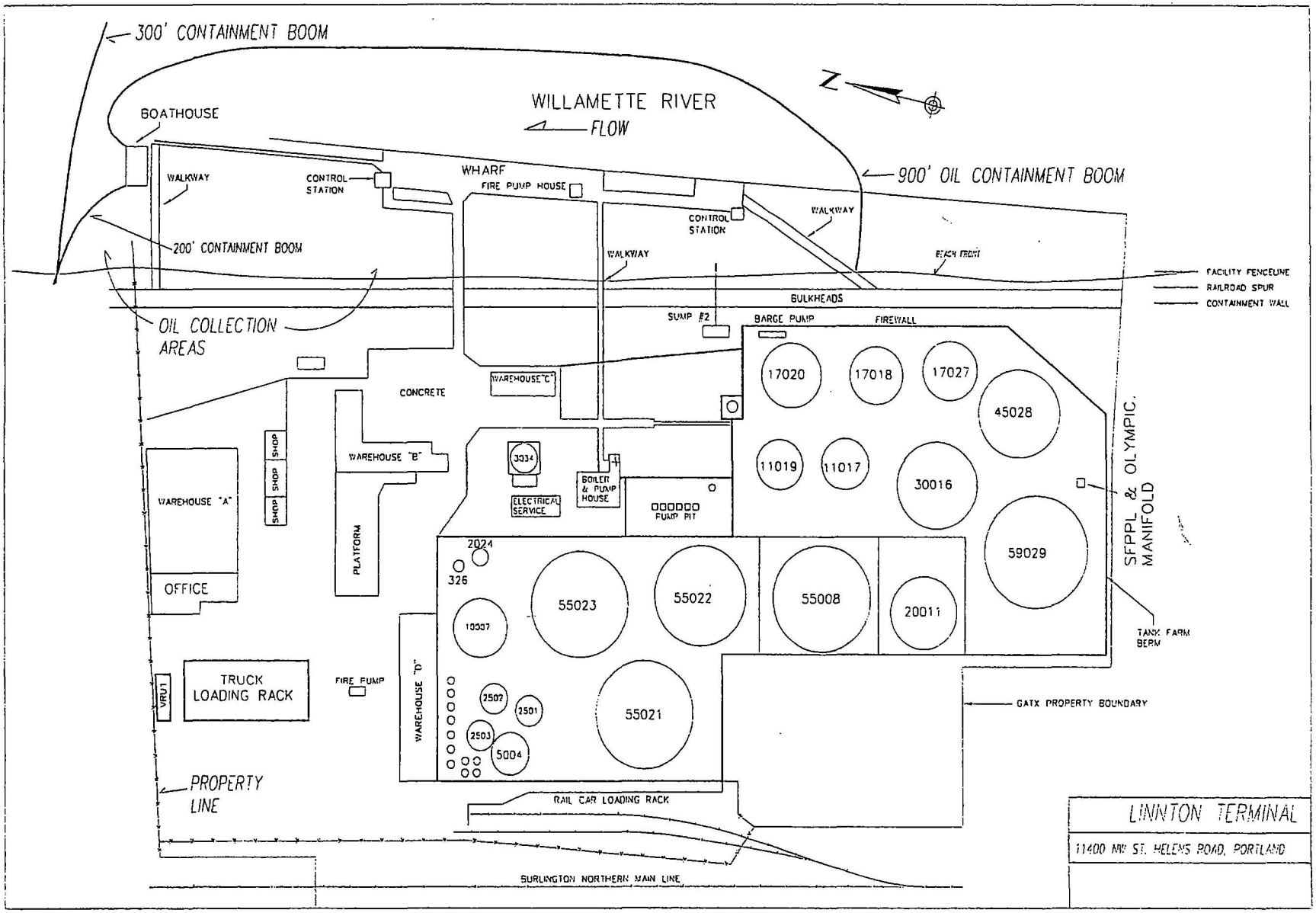
Area Managers are responsible for spill prevention briefings. These briefings are conducted during regular safety meetings for operating personnel to ensure that personnel have an adequate understanding of the SPCC Plan. The topics discussed during the meetings consist of known spill events or equipment failures, procedures used to mitigate or abate any spill events, recently developed precautionary measures, and review of applicable pollution control laws, rules, and regulations.

Personnel are instructed on company procedures for mitigating and abating an oil spill event as outlined in this SPCC Plan. New employees receive instruction on the contents of this SPCC Plan during their orientation. Personnel are updated with current information as it pertains to this SPCC Plan during the safety meetings. Personnel are properly instructed in the operation and maintenance of equipment in order to minimize the likelihood of an oil discharge. Spill prevention briefings are held once a year for all operating personnel.

FIGURES

Figure 1
Site Location Plan

Figure 2
Site Plan



APPENDIX IV

Issue Date: 6/24/82
Revision Date: April 3, 1998
Filename: p:\nwbu1\ehs\linn\dock\uscgman.wpd

ATTACHMENTS

ATTACHMENT 1
SECONDARY CONTAINMENT CALCULATIONS FOR DIKED STORAGE AREAS

Kinder Morgan Liquid Terminals, LLC - Linnton Terminal
SPCC Tank Summary

Tank Area Descr	Containment Area (ft2)	Tank Area (ft2)	Available Cont Area (ft2)	Containment Vol (gal)	Containment Vol (bbl)	Vol of Largest Tk (gal)	Freeboard (ft)	Freeboard (in)	% Cont vs Lgst Tk	Comments
Lower Tk Area	131,209	43,415	95,648	7,154,440.5	170,344	2,456,832	6.57	78.8	291.2	
Largest Tk 59029		7,854				58,496				
Upper Tk Area	81,657	36,957	54,997	4,936,539	117,537	2,324,490	6.35	76.19	212.4	
Largest Tk 55021		10,297				55,345				
20011 Tk Area	10,824	3,848.5	10,824	1,052,526	25,060	856,506	2.42	29.05	122.9	
Largest Tk 20011		3,848.5				20,393				
55008 Tk Area	21,156	10297	21,156	2,848,444	67,820	2,288,832	3.54	42.44	124.4	
Largest Tk 55008		10,297				54,496				
Terminal Manifold/Pump pit	6,935	0	6,935	51,874	1,235	78,750	(0.52)	(6.22)		
1/4 hr resp time vol (bbl)		1,875				1,875				
Loading Rack	5850	0	5,850	38,858	925.19	7,560	0.72	8.58		
Single comp Truck						180				
OWS Volume=3000 gal										
Sump Vol= 3979 gal										

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Lower Tank Area

TANK NO.	PRODUCT	Tank Dia. (Ft.)	Tank Ht. (Ft)	Footprint Area (Ft^2)	Total Capacity (bbls)
17020	Ethanol	60	34.83	2827	17,688
11019	O/S	48	34.83	1810	11,188
11017	O/S	48	34.83	1809.6	11,189
17018	O/S	60	34.83	2827.4	17,517
17027	gasoline	60	34.92	2827.4	17,597
20011	Diesel	70	29.75	3848.5	20,393
30016	Diesel	78	36.00	4778.4	29,852
45028	gasoline	76	56.00	4536.5	44,985
55008	Empty	114.5	29.50	10296.8	54,496
59029	**gasoline**	**100**	**42.00**	**7854.0**	**58,496**
				43415.4	283,401
Gross containment Area (Sq. Ft)=				131,209.0	
Area = [(395*205) - .5(112*53)]+(162*131)+(88*123)+(172*123)					
Available Area (Sq Ft) =				95,647.5	
(Gross Area - footprint area + largest Tk)					
Min containment Wall Height (Ft)=				10.0	
Field Observation					
Ref Dwg: LN-102					
Containment Vol. (bbls) =				170,343.7	
Containment Vol. (gals) =				7,154,436.4	
(Avail area x wall ht)*(7.48gal/ft^3)/(42gal/bbl)					
(Cont. vol. - Largest Tk vol.)/s.area*42/7.48					
Freeboard (ft.) =				6.57	
Freeboard (in.) =				78.8	
100-year/ 24-hour Rainfall (in)=				4.7	
NOAA ATLAS 2, Vol. X, Isopluvials of 100-Yr 24-Hr precipitation (Figure 30)					
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif					
% Containment vs Largest Tank:					
Containment/Largest Tank Vol., Tank 59029 (%)=				291	

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Upper Tank Area

TANK NO.	PRODUCT	Tank Dia. (Ft.)	Tank Ht. (Ft)	Footprint Area (Ft^2)	Total Capacity (bbls)
10007	Empty	55	24.42	2375.8	10,000
55023	Empty	114.5	30.10	10296.8	55,000
55022	gasoline	114.5	30.10	10296.8	54,983
55021	**gasoline**	**114.5**	**30.50**	**10296.8**	**55,345**
2502	Empty	30.00	19.7	706.9	2,482
2501	Empty	30.00	19.9	706.9	2,454
2503	Empty	30.00	19.8	706.9	2,508
2024	Empty	26.00	24.8	530.9	2,188
326	Diesel	10.50	21.1	86.6	300
305	Empty	10.50	20.0	86.6	308
306	Empty	10.50	20.0	86.6	308
309	Empty	10.50	20.0	86.6	308
310	Empty	10.50	20.0	86.6	308
312	Lubes	10.50	20.0	86.6	308
313	Lubes	10.50	20.0	86.6	308
314	Lubes	10.50	20.0	86.6	308
315	Lubes	10.50	20.0	86.6	308
330	Lubes	10.50	20.0	86.6	286
331	Lubes	10.50	20.0	86.6	308
532	O/S	10.50	20.0	86.6	474
				36,956.71	**188,792**
Gross containment Area (Sq. Ft)=				81,657	
Area = (343*249) - (125*30)					
Available Area (Sq Ft) =				54,997	
(Gross Area - footprint area + largest Tk)					
Min containment Wall Height (Ft)=				12	
Ref Dwg: LN-102					
Containment Vol. (bbls) =				117,537	
Containment Vol. (gals) =				4,936,535.39	
(Avail area x wall ht)*(7.48gal/ft^3)/(42gal/bbl)					
(Cont. vol. - Largest Tk vol.)/s.area*42/7.48					
Freeboard (ft.) =				6.35	
Freeboard (in.) =				76.2	
100-year/ 24-hour Rainfall (in)=				4.7	
NOAA ATLAS 2, Vol. X, Isopluvials of 100-Yr 24-Hr precipitation (Figure 30)					
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif					
% Containment vs Largest Tank:					
Containment/Largest Tank Vol., Tank 55021 (%)=				212	

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Tank 20011

TANK NO.	PRODUCT	Tank Dia. (Ft.)	Tank Ht. (Ft)	Footprint Area (Ft^2)	Nominal Capacity (bbls)	
20011	Diesel	70	29.75	3848.5	20,393	
				3848.5	20,393.00	
Gross containment Area (Sq. Ft)=				10824		
Area = 88*123						
Available Area (Sq Ft) =				10824.0		
(Gross Area - footprint area + largest Tk)						
Min containment Wall Height (Ft)=				13		
Ref Dwg:						
Containment Vol. (bbls) =				25060.1		
Containment Vol. (gals) =				1,052,525.76		
(Avail area x wall ht)*(7.48gal/ft^3)/(42gal/bbl)						
(Cont vol - Largest Tk vol)/s.area*42/7.48						
Freeboard (ft.) =				2.42		
Freeboard (in.) =				29.1		
100-year/ 24-hour Rainfall (in)=				4.7		
NOAA ATLAS 2, Vol X, Isopluvials of 100-Yr 24-Hr precipitation (Figure 30)						
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif						
% Containment vs Largest Tank:						
Containment / Largest Tank Vol, Tk 20011 (%)=				123		

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Tank 55008

TANK NO.	PRODUCT	Tank Dia. (Ft.)	Tank Ht. (Ft) 1	Footprint Area (Ft^2)	Nominal Capacity (bbls)	
55008	Empty	114.5	29.50	10296.8	54,496	
				10296.8	54,496	
Gross containment Area (Sq. Ft)=				21,156		
Area = 172*123						
Available Area (Sq Ft) =				21,156.0		
(Gross Area - Tk footprint area + largest Tk)						
Min containment Wall Height (Ft)=				18		
Field Observation						
Ref Dwg:						
Containment Vol. (bbls) =				67,820.09		
Containment Vol. (gals) =				2,848,443.84		
(Cont vol - Largest Tk vol)/s.area*42/7.48						
Freeboard (ft.) =				3.54		
Freeboard (in.) =				42.4		
100-year/ 24-hour Rainfall (in)=				4.7		
NOAA ATLAS 2, Vol X, Isopluvials of 100-Yr 24-Hr precipitation (Figure 30)						
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif						
% Containment vs Largest Tank:						
Containment/Largest Tk,Tank 55008				124	%	

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Manifold/ Pump Pit

Reference Drawing: LN-102					
James Tech Svs (4/1978)					
Field Measurement = 95*73 = (ft^2)		6935			
Asphalt Berm =12 in.					
Available Volume (ft^3) =		6935			
Avail. Volume (gals) =		51873.8			
Avail. Volume (bbls) =		1235.09			
Salt Tower (gal)		10,000			
Total Avail. Vol. (gal) =		11,235			
Flowrate (bbls/hr) =	7,500.00				
Flowrate (gals/hr) =	315,000.00				
15 min. response time (bbls) =		1,875.00			
15 min. response time (gals) =		78,750.00			
5 min response time (gals) =		26,250.00			
Response time = Avail. Cont. Vol/ Q, flowrate					
Available response time (hr) =		0.16			
Available response time (min) =		9.88			
Freeboard = (vol - 5 min. resp vol)/(7.48 gal/ft^3)/area (ft^2) = ft					
Freeboard (ft) =		0.49			
Freeboard (in) =		5.93			
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif					
100-year/ 24-hour Rainfall (in)=		4.7			
Recommend a larger area, asphalt berm or use trough/ sump volume					

Kinder Morgan Liquid Terminals, LLC
Linnton Terminal
Loading Rack

Reference Drawing: LD-802 (Tidewater Oil)M-8-0; 0322-D365(LN-266); 0322-D336 (LN-257)	
James Technical Srvs (4/1978) drawing (1"=50')	
Dimensions: 112.5*.5 *(136-32)	
Surface Area (ft^2) =	5850
Loading rack footprint = 4@8' ea.	
Vol of sump#1 (LN-257) @ 19'x7'x4' (gal)=	3979.36
Volume (bbls) =	520.93
Volume of surface (gals) =	21,879.00
Volume of Holding Sump (gal)	10,000.00
Volume of Sump #1 (gal)	3979.36
Volume of OWS (gals) =	3,000.00
Total available volume for containment (gals) =	*38,858.36*
Volume of truck compartment (bbls) =	180.00
Volume of truck compartment (gals) =	7,560.00
(Cont vol - Largest Truck)/s.area*42/7.48	
Freeboard (ft.) =	30.04
Freeboard (in.) =	360.5
100-year/ 24-hour Rainfall (in)=	4.7
http://www.wrcc.dri.edu/pcpnfreq/or100y24.gif	